

quite recent introduction"; for in chemical books of older date it was always observed, in proof of which see Gmelin's "Handbuch der Chemie" throughout. Gmelin indeed, in the first volume of his great work (4te Auflage, 1843, p. 61, and English Edition, i. 61) lays down the law of the case as follows:—"A number placed before several symbols multiplies them all, *as far as the next + sign or comma*; or if it stands before a bracket, it multiplies all the symbols and numbers included within the brackets." This rule is consistently followed all through the "Handbuch," and, so far as I know, in most contemporary chemical writings; but lately it has fallen into disuse, and a numeral placed before a set of unbracketed symbols is supposed to multiply them all, whether separated by addition-signs (+, .) or not. Now this last practice would be all very well if consistently followed out; but unfortunately it is not, and hence confusion arises. For example, the formula $2\text{SO}_3, \text{H}_2\text{O}$ is used, sometimes to signify $\text{S}_2\text{O}_7\text{H}_2$, that is to say, one molecule of pyrosulphuric acid, while at other times it is employed to denote $\text{S}_2\text{H}_8\text{O}_4$ or $2\text{SO}_4\text{H}_2$, i.e. two molecules of sulphuric acid, which latter, according to earlier usage, would have been represented by $2(\text{SO}_3, \text{H}_2\text{O})$. Again, in the formulæ of basic salts we find such expressions as $3\text{Fe}_2\text{O}_3, \text{SO}_3$, and $2\text{Fe}_2\text{O}_3, 3\text{SO}_3$, &c., in which the co-efficient 3 or 2 is understood to multiply only the Fe_2O_3 , without affecting the SO_3 ; these formulæ being in fact identical with $\text{SO}_3, 3\text{Fe}_2\text{O}_3$ and $3\text{SO}_3, 2\text{Fe}_2\text{O}_3$ respectively. Now it is easy to see that this varying practice in the use or omission of brackets must lead to confusion, and it is much to be desired that the rule which formerly prevailed should be restored to use.

In conclusion, I hope it will be understood that the preceding criticisms are offered solely with the view of promoting uniformity in our nomenclature and notation, and by no means in disparagement of the volume under review, which is in every way a useful and valuable addition to English chemical literature. H. WATTS

OUR BOOK SHELF

Inorganic Chemistry, Theoretical and Practical. An Elementary Text-Book. By William Jago, F.C.S., &c. (London: Longmans, Green, and Co., 1881.)

Practical Chemistry. Adapted to the First Stage of the Revised Syllabus of the Science and Art Department. By J. Howard, F.C.S., &c. (London and Glasgow: William Collins, Sons, and Co., Limited, 1881.)

THE first-named of these books is a really good text-book for laboratory use; the experiments are clearly described; most useful "laboratory hints" are given; conclusions are carefully drawn from the experimental data obtained. The methods for proving the definition of boiling point, for illustrating the manufacture of sulphuric acid, and for confirming quantitatively the equation $\text{KClO}_3 = \text{O}_3 + \text{KCl}$, are especially to be praised. The student who works through this book will have laid a good foundation on which he may afterwards build; only let him skip those parts which deal with "chemical philosophy." Why should he begin his chemical career by learning that "combining weight" is synonymous with "atomic weight" (p. 31)? Why should he trouble himself with committing to memory the "atomaticity" of the most important elements as given on p. 27 of this book? Why should he draw from the statement of Avogadro's law the erroneous conclusion that "the molecules of all gases

are of the same size"? Why should he deceive himself by fancying that the formula (p. 143)

gives him accurate and well-grounded information regarding the molecule of nitrous oxide? No good reason can be given for doing any of these things, therefore let the student use this book as a laboratory guide only, and he will doubtless find it a trustworthy guide.

Could Mr. Howard's chemical philosophy be separated from his directions for conducting experiments, his book might also be recommended to the student of practical chemistry.

Although this book deals with laboratory experiments, one is much tempted to think that the author does not really regard chemistry as an experimental science. He deals with the general principles of chemical science too much from a literary point of view. An instance of this method is found in the preface, where we are told that "in former editions . . . the notation of Dr. Frankland was alone used. . . . In the present edition, however, it has been thought advisable to give, in addition, the notation and formulæ used by Professors Roscoe, Williamson, Thorpe, and others." This sentence is decidedly humorous; it connects so closely phenomena which appear to the student of chemistry to have but little in common.

Authoritative statements from the text-books exert a great influence on the author of this book; witness a sentence on p. 62: "A molecule must have all its bonds engaged, that is, it cannot combine with any substance without altering the arrangement of the atoms. Hence, there must always be an even number of bonds in the molecule of any element or in any compound." Nitric oxide is of course formulated as N_2O_2 ; no hint is given that the molecular formula of this gas is NO.

The first few pages contain many excellent examples of the misuse of that much misused word "force."

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

Primitive Traditions as to the Pleiades

MR. JUSTICE HALIBURTON's letter of December 1 (vol. xxv. p. 100) will have been read by many as calling attention to a curious subject. As it refers especially to me, and indeed arises out of my remark on the story of the "Lost Pleiad" in Dawson's "Australian Aborigines" (NATURE, vol. xxiv. p. 530), I now write a few lines in reply. But it will not be possible to discuss properly Mr. Haliburton's ideas as to the Pleiades till he publishes them in full, with the evidence on which he grounds them. It must not be supposed that the subject has been unnoticed till now by anthropologists. That the Pleiades are an important constellation, by which seasons and years are regulated among tribes in distant parts of the world, that they are sometimes worshipped, and often festivals are held in connection with their rising, that their peculiar grouping has suggested such names as the "dancers," or "hen and chickens," and that numbers of myths have been made about them—all this has long been on record, though in a scattered way, and at any rate it is well known to students. Mr. Haliburton's letter shows that he has new information to add to the previous stock, and furthermore that he has formed a theory that the Pleiad beliefs go back to a marvellously remote period in the history of man, when these stars were, as he says, the "central sun" of the religions, calendars, myths, traditions, and symbolism of early ages. If the astronomical evidence is to support so vast a structure as this, it need hardly be said that it must go far beyond what Mr.

Haliburton mentions in his letter. But when his contemplated book is published, he may be sure of his facts being appreciated and his theories fairly dealt with. Though, as I have just said, this cannot be done here, I may be allowed one suggestion. Mr. Haliburton is good enough to speak of me as being a cautious person. May I in that capacity express a hope that verbal coincidences, when not close enough really to prove connection, may be kept out of an argument which ought to go on a more solid footing. Why should the name of the star *Alkinoos*, king of Corfu? They look indeed rather more alike in Mr. Haliburton's letter, where the latter name is misspelt with a *y*, but doubtless this is a slip of the writer or printer.

A word about my remarks on the Pleiades-myth which has led to this correspondence. The question is only a small one, belonging to comparative mythology, whether a particular Australian tale about the Pleiades, one of a dozen such known in that quarter of the world, is a genuine native myth or a spoilt version of a story borrowed from the white men. I doubted its being genuine, because it says that the lost one of the seven was the queen or chiefess. This is hardly according to nature, for we should expect the star supposed to have gone away to be one of the insignificant ones of the group, not such a bright one as a story-teller would call the queen. Of the many Englishmen who have heard of the "Lost Pleiad" it is curious how few know the probable explanation of the classic tale, as a nature-myth derived from the difficulty of making out more than six stars with the naked eye. It has been suggested by some that there may have been a loss of brilliancy in one of the smaller stars of the group since ancient times. If any of your astronomical readers think there is anything whatever in this supposition, it would be interesting to have their judgment on it.

EDWARD B. TYLOR

Fumifugium

IN justice to Evelyn it ought, I think, to be made known that Mr. Shaw Lefevre was entirely wrong in stating at the opening ceremony of the Smoke Abatement Exhibition that "Evelyn proposed as a remedy for the smoke of which he complained, that the use of coal should be prohibited in the City and neighbourhood of London." "Fumifugium" (which was printed in 1661, and not in 1644) is of course extremely rare, and even the editor of the reprint which was issued in 1772, and is now rare, calls the original "this very scarce tract," so that the way in which the blunder in question has been repeated, is perhaps not to be wondered at.

As a matter of fact Evelyn only mentions the idea of supplanting coal by wood to call it "madness," and he then goes on to say: "But the *Remedy*, which I would propose has nothing in it of this difficulty, requiring only the Removal of such *Trades* as are manifest *Nuisances* to the City, which I would have placed at further distances, especially such as in their Works and Furnaces use great quantities of *Sea-Coale*, the sole and only cause of those prodigious Clouds of *Smoke* which so universally and so fatally infest the *Aer*, and would in no city of *Europe* be permitted, where men had either respect to Health or Ornament," thus recognising the two points of view so well represented by the cooperation of the National Health and Kyrle Societies. "I propose, therefore," he continues, "that by an *Act* of this present *Parliament*, this infernal *Nuisance* be reformed; enjoining that all those *Works* be removed five or six miles distant from *London*, below the River of *Thames*, &c., &c." Although this has been done to a considerable extent, we may, I think, on a foggy day, agree with Evelyn when he says that "the City of *London* resembles the face rather of *Mount Aetna*, the *Court of Vulcan*, *Stromboli*, or the suburbs of *Hell*, than an assembly of rational creatures and the imperial seat of our incomparable *Monarch*."

W. H. CORFIELD

Jamaica Petrel

THIS bird, known locally as the "Blue Mountain Duck" or "Booby Duck," appears in a carefully compiled list of the birds of Jamaica, by Prof. A. Newton and his brother, the Hon. Ed. Newton, Colonial Secretary of Jamaica, published in the "Jamaica Handbook," 1881, p. 117, as follows:—"PROCELLARIIDÆ—*Œstrelata jamaicensis*, Bancroft, Jamaica Petrel. *Procellaria jamaicensis*, Bancroft, Zool. Journ. v. p. 81; Blue Mountain Duck, Gosse, "Birds of Jamaica," p. 437 (Hill);

Pterodroma caribbaea, Carte, P.Z.S. 1866, p. 93, Pl. x." During certain seasons of the year it is remarkable that this sea-bird should be found in holes under trees and in burrows on the Cinchona plantations and in the unfrequented woods of the Blue Mountain range, at elevations from 6000 feet to 7000 feet. The natural inference was that the birds make their nests on these places. But, although careful search has been made during the last two years, and a reward offered for nests, eggs, or any signs of nidification, nothing whatever has been found in that direction. It is therefore very probable that the birds use these holes and burrows simply as resting-places during the day, from whence they sally forth at night to their feeding-grounds at sea. The latter is distant only, as the crow flies, about twelve or fourteen miles. The birds are found in their burrows chiefly during the months of November, December, January, and March. Sometimes two lie in one hole, and dogs easily find them; but it has been noticed that the birds are always full grown, and with no apparent nest. I have been led to send you these remarks in the hope that possibly some of your readers with a wider knowledge of the habits of petrels might be able to give some clue as to the locality and general character of their nesting-places.

D. MORRIS

Botanical Department, Jamaica, November 14

Biology in Schools

MANY eminent biologists seem to think that there are insuperable difficulties in the way of sound biological instruction in public schools. Possibly my experience in this connection may be of interest. I began to teach biology some ten years ago. Two years' experience satisfied me "that the power of repeating a classification of animals with all the appropriate definitions has any thing to do with genuine knowledge is one of the commonest and most mischievous delusions of both students and their examiners." For the third year I prepared a series of laboratory notes sufficient for the dissection of a few plants and animals. Since the publication of Huxley and Martin's admirable text-book of biology we have used that as a laboratory guide. Through the liberality of the School Board we are provided with eight of Beck's students' microscopes. We begin with the study of the tortula; we then take in succession the following organisms:—*Protococcus*, *ameeba*, *bacteria*, *mould*, *stone-wort*, *ferns*, *flowering plants*, *infusorian*, *fresh-water polyp*, *clam lobster*, and *frog*. We devote to laboratory work one hour daily for seven months. At the end of the course come morphological and physiological generalisations. Our classes number about eighty, and are divided into working sections of sixteen each. The average age of the students is sixteen years, rather more than half of them being girls. I have found the students eager and enthusiastic, and a large majority of them regret the untimely end of their study of biology. To enter college a lad needs between four and five years' work in Latin, and, if a scientific student, about five weeks in botany. Most of our high schools accept this estimate of the value of a scientific training, and only do the little that is necessary for the pass examination.

GEO. W. PECKHAM

Biological Laboratory, Milwaukee High School,
Milwaukee, Wisconsin

A Natural Ant Trap

LAST June I was staying at Husum, in the Lærdal Valley, Norway, and observed on the almost precipitous sides of the valley facing the south, immediately behind the station-house, a considerable number of the red German catchfly (*Lychnis viscaria*). The plants were growing luxuriantly at an altitude of some 1000 feet above the bed of the river, and were just then showing a gorgeous array of blossoms. On plucking some of the flowers I became aware of a most unpleasant stickiness around the stems; in some instances the glutinous secretion being powerful enough to support the whole weight of the stem when I inverted and opened my hand. Thereupon I carefully examined more than a hundred plants, and was somewhat surprised at finding, on quite 95 per cent., either the dead bodies of a large species of ant, or individuals in all stages of dying. Some flowering stems had only one dead or dying ant upon each; others had two; others three; whilst others again had as many as seven or eight. Some ants had, as it were, simply lain down in the glutinous matter and succumbed without further struggling. The heads of others, firmly imbedded in the treacherous stuff,